

## **REMARKS**

Examiner is thanked for the performance of a thorough search. Claims 1, 5-7, and 10-13 are amended. No claims are cancelled or added. Hence, Claims 1-21 are pending in the Application.

### **I. CLAIM OBJECTIONS**

Claim 1-9 are objected to because of alleged informalities. Specifically, the Office Action asserts that the recitation “the computer-implemented steps” should be rewritten as “computer-implemented steps.” Applicant respectfully disagrees with the objection. However, to advance prosecution, Claims 1 and 5-7 have been amended to avoid the alleged informalities. Claim 2-4, 8 and 9 therefore are also free of the alleged informalities by reason of dependency. Removal of the objection is respectfully requested.

### **II. ISSUES RELATING TO 35 U.S.C. 101**

Claim 10-13 are rejected for being allegedly directed to non-statutory subject matter. Claims 10-13 have been amended to address this issue. Removal of the rejection is respectfully requested.

### **III. ALLOWABILITY OF CLAIM 6**

Applicant appreciates the indicated allowability of Claim 6. It appears that the Office Action incorrectly states that Claim 6 is objected to because it is allegedly in dependent form. Claim 6 is in independent form. Clarification is respectfully requested. Removal of the objection is respectfully requested.

### **IV. ISSUES RELATING TO 35 U.S.C. 102(e) —CAIN**

Claims 1-5, and 7-21 are rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Cain et al., U.S. Pub. No. 2003/0202468 (hereinafter *Cain*). The rejection

is respectfully traversed.

**Claim 1**

Claim 1 is directed to a computer-implemented method of discovering a network path that satisfies a quality of service (QoS) requirement, and recites:

receiving, at a first router, a first data packet that indicates a destination and said QoS requirement;  
updating said first data packet to indicate an identity of said first router;  
determining whether a least-delay path from said first router to said destination satisfies said QoS requirement;  
determining whether said first data packet has visited any router in said least-delay path other than said first router;  
if said least-delay path satisfies said QoS requirement and said first data packet has not visited any router in said least-delay path other than said first router, then sending said first data packet to a second router in said least-delay path; and  
receiving, at said first router, a second data packet that indicates a path taken by said first data packet to said destination. (Emphasis added)

Claim 1 provides a way for selecting routing paths that satisfy QoS requirements in connection with an ant-based routing method. The approach of Claim 1 employs a forward data packet (i.e., the first data packet of Claim 1) that specifies a destination and a QoS requirement and a backward data packet (i.e., the second data packet of Claim 1) that carries back path information collected by the forward data packet. Specifically, as specified by Claim 1, a first router receives the first packet that indicates a destination and a QoS requirement, sends the first data packet to a second router towards the destination on a least-delay path from the first router to the destination, and subsequently receives the second data packet that indicates a path taken by the first data packet to the destination. As further specified by Claim 1, the least-delay path satisfies the QoS requirement that was specified in the received first packet.

Such a method is not disclosed by *Cain*.

*Caini*

*Cain* pertains to a mobile ad-hoc network in which a source node can explore a number of routes that lead to a destination node and select a path that scores the best in QoS ranking. As shown in FIG. 8, FIG. 9 and FIG. 10 of *Cain*, nodes of the mobile ad-hoc network form clusters. The source node in one cluster may broadcast a route request carrying a flow identifier and an updatable QoS link metric (*Cain* paragraph 0043). Nodes within the range of such a (wireless) broadcast receive this route request. Each such node may determine whether it has a link that satisfies a QoS requirement specified in the route request. If so, a reservation will be made and the route request will be updated with a metric of the node.

Notably, in such a network, each node does not have a notion of path, but only forms ad-hoc paths through frequent route exploration, since the network configuration is dynamically changing due to, for example, the relative mobility of the nodes. Each node reaches its neighbors by its signal transmission strength. Thus, according to *Cain*, a node cannot determine whether a path exists, but can only keep sending the route request based on its own link or node metric (see, e.g., *Cain* paragraph 0044 lines 4-7). If a route request reaches the destination, the destination will send back a route reply. The source node may receive multiple route replies indicating multiple routes. Subsequently, the source node may select a route that ranks best among the routes and send a confirmation.

*Cain* fails to disclose a number of features in Claim 1. For example, Claim 1 recites “receiving, at a first router, a first data packet that indicates a destination and said QoS requirement.” Claim 1 also recites “determining whether a least-delay path from said first router to said destination satisfies said QoS requirement.”

The Office Action apparently analogizes the route request of *Cain* to the first data

packet of Claim 1 and the route reply of *Cain* to the second data packet of Claim 1. The Office Action further analogizes an intermediate node that receives the route request to the first router of Claim 1.

Applicant respectfully submits that these analogies are incorrect. In *Cain*, **an intermediate node** does not determine a least-delay path from the non-source node to the destination node. In *Cain*, only **the source node** determines the least-delay path from the source node to the destination node. An intermediate node only determines whether it can support the QoS specification or not (*Cain* paragraph 0044). The intermediate node does not have an overall path metric such as described in *Cain* paragraph 0053 that enables a selection of a least-delay path. Only the source node carries out a least-delay path calculation such as described in *Cain* paragraphs 0055 and 0056.

Further, the source node of *Cain* cannot correspond to the first router of Claim 1 because the source node originates the route request and hence cannot possibly disclose receiving the route request, even if the route request of *Cain* is analogized to the first data packet recited in Claim.

Claim 1 further recites “determining whether said first data packet has visited any router in said least-delay path other than said first router.” Since an intermediate node of *Cain* has no notion of the least-delay path as noted above, such an intermediate node cannot possibly determine whether the first data packet has visited any router in the least-delay path other than the first router.

For the reasons given above, Claim 1 is patentable over *Cain*. Reconsideration is respectfully requested.

**Claims 5, 7, 10, 14, and 18**

Application of Fuyong Zhao, Ser. No. 10/665,190, Filed 09/15/2003  
Reply to Office Action

Claims 5, 7, 10, 14, and 18 each recite similar features as those discussed above with respect to Claim 1. Therefore, Claims 5, 7, 10, 14, and 18 are patentable for at least the same reasons discussed above as to Claim 1. Reconsideration is respectfully requested.

**Claims 2-4, 8, 9, 11-12, 15-17, and 19-21**

Claims 2-4, 8, 9, 11-12, 15-17, and 19-21 are dependent upon and thus include each and every feature of Claim 1, 5, 7, 10, 14, or 18 discussed above. Therefore, it is respectfully submitted that Claims 2-4, 8, 9, 11-12, 15-17, and 19-21 are allowable for at least the reasons given above with respect to Claim 1, 5, 7, 10, 14, or 18.

Reconsideration is respectfully requested.

V. CONCLUSION

For the reasons set forth above, Applicant respectfully submits that all pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Respectfully submitted,

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